# *Aegiphila brenesii*, a New Name for the Long-lost (Right Before Our Eyes) *Clerodendrum costaricense* (Lamiaceae)

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Abstract. *Aegiphila brenesii* Hammel (nom. et comb. nov.) is validated to replace *Clerodendrum costaricense* Standl., the epithet of which is preoccupied in *Aegiphila* Jacq. (Lamiaceae) by *A. costaricensis* Moldenke. The species in question has been known until now from only the two rather inadequate collections cited in the protologue. We find that it was misplaced to genus and that recent collections had been overlooked and included in a broad concept of *A. quararibeana* Rueda, a similar species of lower elevations.

Resumen. *Aegiphila brenesii* Hammel (nom. et comb. nov.) se publica para reubicar *Clerodendrum costaricense* Standl., dado que su epiteto ya se usa en *Aegiphila* Jacq. (Lamiaceae) para *A. costaricensis* Moldenke. Hasta ahora, esta especie se había conocido solamente de las dos recolecciones, bastantes inadecuadas, citadas en el protólogo. Encontramos que fue mal ubicada al género, y que recolecciones recientes habían pasado desapercebidas e incluidas en un concepto amplio de *A. quararibeana* Rueda, una especie parecida de elevaciones más bajas.

*Key words:* *Aegiphila*, *Clerodendrum*, Costa Rica, Lamiaceae, Verbenaceae.

Stimulated by a recent publication (Yuan et al., 2010) that realigns species of *Clerodendrum* L. occurring in the Mesoamerican region into two genera, in conjunction with our ongoing efforts to edit and revise the Verbenaceae (s.l.) treatment for the *Manual de Plantas de Costa Rica*, the first author made a trip in April 2010 to the type locality of the little-known *C. costaricense* Standl. [≡ *Volkameria costaricensis* (Standl.) Mabb. & Y.-W. Yuan] in search of new material to provide data missing from the description of that species.

In fact, because of its lianescent habit, much larger leaves, and montane habitat, this species differs markedly from the other native Costa Rican species of *Clerodendrum* (or *Volkameria* L.), and we had wondered years ago if it might belong to some other genus. The type collection (*Austin Smith H588*), with only a few flower buds and one or two partial flowers, was made in April 1938, near La Peña de Zarcero, Alajuela Province, at 1650 m elevation. An additional specimen cited in the protologue (Standley, 1938: 1002) from nearby Los Ángeles de San Ramón (*A. Brenes 6147*), also collected in April (1938), comprises a branch with just one attached inflorescence, with two flowers (calyx only). The April 2010 collecting trip to La Peña netted abundant material of the species (*B. Hammel & I. Pérez 25612*), with just one flower at anthesis, but plenty of others in various stages en route to mature fruits. The coincidence of those particular fruits on flowering material identical to the type of *C. costaricense* (and at its type locality) was unexpected, and immediately brought to mind *Aegiphila quararibeana* Rueda. Our recently completed review of the *A. quararibeana* collections at INB had resulted in the inclusion of the following note under the description of said species in the aforementioned *Manual de Plantas de Costa Rica* manuscript: "Material de las Cords. de Guanacaste, de Tilarán y Central, arriba de 700 m (p. ej., *Bello 4880*; CR, INB, MO) es practicamente glabro y tiene infls. más grandes que el resto del material. Posiblemente representa una entidad distinta." In fact, this entity, collected numerous times during the past 26 years, had long since been described (as *C. costaricense*), but from sparse material, hence the taxonomic confusion. Here we provide a new name, the necessary nomenclatural and taxonomic background demonstrating the need for a new name, and an expanded description.

**Aegiphila brenesii** Hammel, nom. et comb. nov. Replaced name: *Clerodendrum costaricense* Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 18: 1002. 1938, non *Aegiphila costaricensis* Moldenke, 1933. *Volkameria costaricensis* (Standl.) Mabb. & Y.-W. Yuan, Taxon 59(1): 132. 2010. TYPE: Costa Rica. Alajuela: La Peña de Zarcero, 4 Apr. 1938, *Austin Smith H588* (holotype, F; isotypes, MO, NY).

Scandent shrub to 5 m, or high-climbing liana; plants dioecious; branchlets glabrous, yellowish tan,

 doi: 10.3417/2010063

shiny. Leaves with the petiole 1–2 cm; blade 9–14 × 4.5–9 cm, ovate-elliptic, rounded to acute at the base, obtuse to acuminate at the apex, entire, glabrous on both surfaces, with abundant glandular dots (≤ 0.1 mm) on the abaxial surface (but without glandular disks), with 5 to 7 secondary nerves per side. Inflorescences axillary, lax, 1.5–3.5 × 1.5–5 cm (exclusive of the peduncle), the largest bracts foliar, 6–20(–25) × 1–5 mm, stipitate; peduncle 1.5–6 cm. Flowers 1 to 6, heterostylous, but functionally unisexual, with pedicel 1–9 mm; calyx 10–13 mm, tubular, with 4 narrowly triangular, apically rostellate lobes 1–1.5 mm (2 opposite sinuses often splitting to ca. 1/2 the tube as the corolla emerges, the other 2 splitting to 1/4 at most), indistinctly 4-ridged, strigulose to nearly glabrous, much-expanded in fruit and completely covering the developing fruit (but ultimately splitting open and leaving the mature fruit only partially covered); corolla cream-colored or greenish cream, glabrous (externally), ± trumpet-shaped, the tube ca. 13 mm, tomentose at point of stamen insertion, the lobes 4, ca. 10 mm; stamens 4, of equal length, inserted on the corolla tube about midway, the filaments tomentose at point of insertion, in staminate flowers ca. 10 mm, well-exserted from the tube but not beyond the lobes, the anthers ca. 3 mm, in pistillate flowers the filaments ca. 4 mm, the anthers (lacking pollen) ca. 2 mm, barely 1/2 exserted from the narrow part of the corolla tube; style in staminate flowers ca. 4 mm, hidden within the corolla tube, in pistillate flowers ca. 24 mm (including the 2 branches, ca. 8 mm), well-exserted from the corolla tube. Fruits brown, 2.5–3 cm, ± globose, 1/3–1/2 covered by the irregularly 4-lobed calyx.

*Distribution, habitat, and phenology.* *Aegiphila brenesii* is endemic to Costa Rica in pluvial, cloud, and oak forest at 1100–1700+ m elevation, on the Caribbean slope and near the Continental Divide of the Cordilleras de Guanacaste (Volcán Tenorio), de Tilarán, and Central, and on the Pacific slope of the Cordillera Central (Volcán Poás). The species has been collected in flower during March and April, and with fruits in March, April, August, and September. Considerable confusion has been propagated with regard to the elevation of *E. Bello & E. Cruz 4880*; even though the original field notes indicate an elevation of 1200 m, the labels distributed indicate "700 m." We have chosen to respect the original notes as more likely to be accurate.

*IUCN Red List category.* Although *Aegiphila brenesii* does occur in at least one private reserve (Reserva Monteverde), it is not known from any national park and is restricted to a rather narrow elevational range. At the type locality, only very small, isolated patches of forest remain on the steepest slopes and highest peaks, surrounded by extensive pastures and other agricultural lands. Given increasing population pressure and global warming, *A. brenesii* must certainly be classified as Vulnerable (VU), according to IUCN Red List Criteria (IUCN, 2001).

*Etymology.* The epithet honors Alberto M. Brenes (1870–1948), apparently the first botanist to collect the species. His collections, numbering over 20,000, mostly from the region around his hometown of San Ramón (and encompassing the type locality of *Aegiphila brenesii*), will forever be important to Costa Rican floristics.

*Relationships and history.* *Aegiphila* Jacq. species, in contrast to those of *Clerodendrum* and *Volkameria*, are heterostylous but probably dioecious (see below). *Aegiphila brenesii* is closely related to the more widespread *A. quararibeana*, under which name the majority of material of it has been filed over the past 16 years. It shares with that species unusually large flowers and fruits for the genus, as well as the lianescent habit. It differs by its larger inflorescences ([4–]6–8 cm [including the peduncle] vs. 2–3.5 cm) with larger bracts (6–20[–25] × 1–5 mm vs. ca. 5 × 0.5–2 mm) and its glossy and glabrous (vs. opaque and granulose-puberulent) branchlets. *Aegiphila quararibeana* occurs at lower elevations in Costa Rica (0–800 m) and on both slopes, attaining 800 m elevation in the Acosta region of the Pacific slope. By virtue of their large flowers and fruits, both of these species are similar to the lowland Amazonian *A. macrantha* Ducke, with which *A. quararibeana* has already been compared (Rueda, 1994). Although the peduncles of *A. macrantha* (ca. 1–6.5 cm) can be as long as those of *A. brenesii* (1.5–6 cm), the inflorescence proper is much more congested (the flowers and bracts sessile to subsessile) and even more conspicuously bracteate, the bracts closely approximate on the abbreviated inflorescence axes with the largest ones 6–15(–25) × 3–11 mm. The branchlets of *A. macrantha* are granulose-puberulent, like those of *A. quararibeana*, not glabrous like those of *A. brenesii*.

How and why the two original specimens of *Clerodendrum costaricense* were never associated with *Aegiphila* until now is probably due, in part, to the paucity of flowers on the original material, and the fact that the few available flowers are young and staminate, obscuring the similarity of the species to *A. quararibeana*, known for its unusually large fruits. That something was amiss might have been suspected

from a contradiction in Standley's original description, where the phrase "flowers four-parted" is quoted from Austin Smith's label notes, even while *Clerodendrum*, in the same publication, is described as having the calyx 5-merous. Likewise, Rueda (1993) characterized *Clerodendrum* as having the calyx and corolla 5-parted, but included the 4-merous *C. costaricense* without comment. One collection of what is now realized to be *A. brenesii* from Monteverde with abundant staminate flowers (*Bello & Cruz 4880*) might reasonably have been compared to *C. costaricense*, except for the fact that it combines detached fruits or fruit pieces (certainly from a different individual) with staminate leafy branches; no one ever hesitated in associating it with *A. quararibeana*, nor expected such fruits on *C. costaricense*. Furthermore, we became aware of the heterostylous but apparently dioecious nature of most species of *Aegiphila* only recently, while examining specimens during the editing of the *Manual* manuscript, and were reminded of the hermaphroditic flowers (with didynamous stamens) of *Clerodendrum* (and *Volkameria*) on reading Yuan et al. (2010). The literature is noncommital or contradictory with regard to the sexuality of *Aegiphila*. For example, Moldenke (1973: 102) stated that the flowers of *Aegiphila* are "hermaphroditic but usually conspicuously declinous [sic]," whereas Croat (1978), explicitly acknowledging Moldenke's observation, nevertheless considered the flowers to be simply heterostylous. We have seen no specimens with exserted stamens that also have even immature fruits, and any flowers on fruiting specimens have always included stamens that lack pollen. In any case, as pointed out by Yuan et al. (2010), *Aegiphila*, *Clerodendrum*, and *Volkameria* are closely related taxa; they have been confused and differently circumscribed in the past, as they will most certainly continue to be. But for now, the long-lost *Clerodendrum costaricense* has been rediscovered at its type locality and found among recent collections, right before our eyes, properly filed under *Aegiphila*.

*Additional specimens examined.* COSTA RICA. **Alajuela:** Cantón de Alajuela, Hotel Posada Volcán Poás, 13 Mar. 2003 (bud), *R. Kriebel 2910* (INB); Cantón de Guatuso, Parque Nac. Volcán Tenorio, Alto Masís, 20 Sep. 2001 (fr.), *J. L. Chaves, G. Rodríguez, I. López & A. López 1315* (INB); [Cantón de San Ramón], Los Angeles y La Paz, 30 Apr. 1928 (fl.), *A. Brenes 6147* (F); Río La Balsa, 30 Aug. 1991 (fr.), *E. Bello 4006* (INB); Cantón de Zarcero, La Peña, 17 Abr. 2010 (fl., fr.), *B. Hammel & I. Pérez 25612* (CR, INB, MO). **Guanacaste:** Cantón de Tilarán, Río Caño Negro, 11 Mar. 1993 (fl., fr.), *E. Bello & E. Cruz 4880* (CR, INB, MO). **Puntarenas:** Cantón de Puntarenas, Reserva Biol. Monteverde, 21 Aug. 1984 (fr.), *A. Gentry & W. Haber w/Class 84-3 48713* (MO).

*Acknowledgments.* We thank Daniel Santamaría (INB) for examining material of *Clerodendrum costaricense* during his recent visit to F, and for sending an image of *Brenes 6147* (F).

Literature Cited

Croat, T. B. 1978. Flora of Barro Colorado Island. Stanford University Press, Palo Alto, California.

IUCN. 2001. IUCN Red List Categories and Criteria, Version 3.1. Prepared by the IUCN Species Survival Commission. IUCN, Gland, Switzerland, and Cambridge, United Kingdom.

Moldenke, H. N. 1973. Verbenaceae. *In* R. E. Woodson Jr. & R. W. Schery (editors), Flora of Panama. Ann. Missouri Bot. Gard. 60: 41–148.

Rueda, R. M. 1993. The genus *Clerodendrum* (Verbenaceae) in Mesoamerica. Ann. Missouri Bot. Gard. 80: 870–890.

Rueda, R. M. 1994. A new scandent species of *Aegiphila* (Verbenaceae) from Costa Rica. Novon 4: 293–295.

Standley, P. C. 1938. Flora of Costa Rica. Publ. Field Must. Nat. Hist., Bot. Ser. 18(3): 783–1133.

Yuan, Y.-W., D. J. Mabberley, D. A. Steane & R. G. Olmstead. 2010. Further disintegration and redefinition of *Clerodendrum* (Lamiaceae): Implications for the understanding of the evolution of an intriguing breeding strategy. Taxon 59: 125–133.